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TITLE: Method of fabricating SOI wafer

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Brief Summary Text - BSTX (9):

[circle around (3)] A silicon epitaxial layer heavily doped with boron is grown by vapor-phase epitaxy on the bonding surface (referred to as first main surface) side of the bond wafer. The bond wafer is then bonded to the base wafer on its silicon-epitaxial-layer side, and the bond wafer is removed by grinding halfway from the side opposite to the bonding surface. Lastly, the residual portion of the bond wafer is selectively etched based on difference in the boron concentration up to a level of the high-boron-concentration silicon epitaxial layer, to thereby leave the silicon epitaxial layer as the SOI layer (so-called boron etch stop process).

Brief Summary Text - BSTX (13):

It is inevitable in the boron etch stop process [circle around (3)], as shown in FIG. 13A, to adopt process steps in which an epitaxial layer 11 heavily doped with boron is formed on the bond wafer 2, bonding annealing is carried out so as to bond the silicon oxide film 3 to the base wafer 1, and the bond wafer 2 is then thinned by grinding and etch back. Because the bonding annealing is generally carried out at a temperature of as high as 1,000 to 1,300.degree. C., as shown in FIG. 13B, the boron concentration profile in the vicinity of the interface of the epitaxial layer 11 is broadened and loses its sharpness, and this makes etch stop per se impossible. This inevitably requires lowering of the bonding annealing temperature to as low as 800 to 900.degree. C., where another problem arises in that it is made impossible to attain a sufficiently large bonding strength, and that a lot of unbonded areas, called voids, are generated, and that the bond interface becomes more likely to be eroded in the etch back process.